

# **ABC SAMPLING**

**February 5, 2003**  
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North Carolina Department of Transportation  
Materials and Tests Unit - Soils Laboratory

## SECTION I - PURPOSE

The purpose of this training course is to explain the techniques for obtaining Aggregate Base Course (ABC) samples from roadways. These samples are called Roadway Assurance (RA) samples. The North Carolina Department of Transportation (NCDOT) is responsible for obtaining and testing these samples to check the material against gradation specification requirements. Any technician obtaining a RA sample for specification acceptance must have a valid ABC Sampling Certification.

Under the current Aggregate Quality Control/Quality Assurance (QC/QA) Program, NCDOT certified representatives of aggregate producers obtain Quality Control (QC) samples and NCDOT Materials Inspectors obtain Quality Assurance (QA) samples at the quarry. This is sampling of the material prior to roadway placement. Sampling under this Program is discussed in the QC/QA Sampling and Testing Certification Course. Under the QC/QA Program aggregate producers can also take Roadway Quality Control (RC) samples from the roadway for their internal use, that is, to obtain additional information concerning quality. Due to safety concerns an aggregate producer representative must obtain permission from Resident Engineer prior to visiting the construction project.

Resident Engineers are scheduled to receive copies of aggregate producers QC test results within 72 hours after the sample was obtained. The Resident Engineer should review the QC test results to verify if minimum specifications have been met and if any penalty points were applied to the contract price. Due to the importance of aggregate materials, representative(s) of the Department should study Sections 520, 1005, 1006, 1008, and 1010 of the **NCDOT Standard Specifications for Roads and Structures**, plans, project special provisions, and sections relating to ABC material in Division 5 of the **NCDOT Construction Manual**. Additional details regarding the QC/QA Program can be obtained from the QC/QA Program and Testing Manuals produced by the NCDOT Materials and Tests Unit.

## SECTION 2 – IMPORTANCE OF PROPER SAMPLING

A sample is defined as a “portion, piece, or segment that is representative of a whole”. It is therefore important that the procedure(s) used to obtain this small portion not compromise the requirement that it be a representation of the larger portion.

As will be discussed in the sections that follow, each ABC sample consists of a pair of samples - “A” and “B”. This sample pair is taken to a NCDOT laboratory and tested for gradation. The results of the two individual tests are averaged and compared with the gradation requirements given on Table 1010-1 in the **NCDOT Standard Specifications for Roads and Structures** (Specifications).

There are penalties associated with non-conformity with the Specifications. For material that has been laid out on a roadway, non-conformity can result in a rejection of the material. Improper sampling (that is, when the portion obtained did not represent the

larger portion) of the ABC has repercussions that can be costly. Following proper sampling procedures cannot be overemphasized.

### **SECTION 3 – AGGREGATE BASE COURSE – DEFINITION AND TYPES**

Aggregate Base Course (ABC), as defined in the Specifications is “a base composed of an approved aggregate material hauled to the road, placed on the road, compacted, and shaped to conform to the lines, grades, depths, and typical sections shown in the plans or established by the Engineer”. The base is the layer directly above the subgrade.

There are two types of ABC material depending on how and when they are tested for conformity to specifications. These are: Type A ABC and Type B ABC. Type A ABC is sampled by the producer from a production pile. Type B ABC is sampled by the producer from an “approved” stockpile, which has specific permissible dimensions in terms of layer thickness, tonnage per layer, etc. There is tighter control in building an approved stockpile compared to a production pile. At a quarry, a production pile may have material being added at one end of the pile while simultaneously material is being taken from another end. For an approved stockpile, the material is continuously added until the specified pile is built up, and then used for a project without further addition of material to that pile. Both, however, are used for roadway projects.

### **SECTION 4 – ROADWAY ASSURANCE (RA) SAMPLING**

Whether Type A ABC or Type B ABC is used for a roadway, it has presumably already been tested by the producer (QC) and by the State (QA) for conformity with specifications while the material is still at the quarry. Again, the purpose of obtaining RA samples is to ensure that the quality of the material placed in the roadway is no different from the quality of the material from the quarry that has satisfied the QC/QA Program requirements.

The sampling procedure to be used depends on whether the samples will be obtained before or after placement of the material on the roadway. In situations whereby the material is to be mixed with other materials prior to roadway placement, (that is, when to be used as “Stabilizer Aggregate” or “Cement Treated Base Course”), samples of the material will be taken prior to mixing.

#### **A. Roadway Sampling**

When sampling ABC from the roadway, a NCDOT-approved sampling ring is used. The purpose of the sampling ring is to “isolate” the sample from the rest of the roadway. The specifications for this ring and the procedure to be followed in sampling are given in Appendix A.

As previously mentioned, each test will require a RA sample pair - “A” and “B”. Both “A” and “B” samples must weigh a minimum of 70 pounds dry in order to be processed.

Whether Type A ABC or Type B ABC is used, a sample pair is taken for every 5,000-ton lot or fraction thereof. The “A” sample is taken from the first half of the lot (i.e. the first 2,500 tons), and the “B” sample is taken from the second half of the lot (i.e., the second 2,500 tons). Random numbers are used to locate sampling sites in order to prevent biased sampling. The procedure for using random numbers is described in Appendix B. If the Specifications require two layers of ABC to be placed, close-out the sampling lot of the first layer prior to placement of the second layer of material.

#### B. Sampling ABC used as “Stabilizer Aggregate”

In order to stabilize some subgrade soils, a two- to three-inch thick layer of Stabilizer Aggregate is added and mechanically mixed with the soil. In order to obtain a representative sample, the Stabilizer Aggregate is sampled while it is in the spreader box prior to placement. Each test will require a RA sample pair - “A” and “B”. Both “A” and “B” samples must weigh a minimum of 70 pounds dry in order to be processed. The guidelines for determining the lot size are given below and are exactly the same for roadway sampling.

If the spreader box contains Type A ABC or Type B ABC, a sample pair is taken for every 5,000-ton lot or fraction thereof under the QC/QA Program. The “A” sample is taken from the first 2,500 tons, and the “B” sample is taken from the second 2,500 tons. Random numbers are used to determine sampling tonnage in order to prevent biased sampling. The procedure for using random numbers is described in Appendix B.

When a dump truck loads the material in a spreader box, typically a conical pile is formed. In sampling, the upper half of this conical pile is struck off and the required sample obtained using a sampling ring (see Appendix A) from the exposed flat surface.

#### C. Sampling ABC used for Cement-Treated Base Course (CTBC)

Cement is added to ABC and mixed in a pugmill to obtain CTBC. Cement is added to the ABC along a conveyor belt leading to the pugmill. Sampling of the ABC must be done before the cement is added. The guidelines are the same as those used for determining the frequency of roadway sampling and stabilizer aggregate sampling.

Equipment required for this method of sampling include a flat-tip shovel, a brush, a 5-gallon bucket, a scoop, sample bags, and I.D. cards (M&T Form 1).

Random numbers are used to determine the tonnage at which the sample is to be taken (see Appendix B). To obtain a sample, the conveyor belt is stopped at the appropriate tonnage and a flat-tip shovel is used to isolate about an 18-inch section. Using a scoop, the material in that isolated section is placed into a 5-gallon bucket and later transferred to

bags. It is important that all the material in that isolated section be removed, including the fines that can be removed with a brush. This procedure is used to obtain both samples “A” and “B”.

## SECTION 5 – SAMPLE IDENTIFICATION AND NUMBERING

Samples are given an “RA” designation followed by the sample number, and then an “A” or a “B”. For example, the first 5,000 ton sampling lot on a given project will be represented by a sample pair labeled RA-1A and RA-1B, each weighing 70 pounds minimum. The second 5,000 ton sampling lot would be labeled RA-2A and RA-2B, followed by RA-3A and RA-3B, and so on. Numbering will start with “1” and will run consecutively for the entire project.

Both “A” and “B” samples shall be submitted to the NCDOT laboratory at the same time. Sample cards are to accompany the samples. One sample card is filled for each bag of material. When completing the represented quantity (\***Rep. Qty:**) line on the sample card, enter the total amount of material represented by the sample. For example, if sample RA-4A and RA-4B represents 3225 tons then record 3225 tons on each card. The cards should be placed in a plastic bag to prevent it from being damaged, and then placed in the corresponding sample bags.

Figure 1 shows an example of an accomplished sample card.

The beginning and ending location for each sampling lot should be recorded to ensure the section can be identified if check samples are required.

* Required Field		HICAMS #: <span style="border: 1px solid black; padding: 2px;">260769</span>	
† May Be Required Based on Material			
* Material: <u>ABC</u>		<input type="checkbox"/> Metric <input checked="" type="checkbox"/> English	
† Sample Owner: <u>PROJECT</u>	† Contract #: <u>C200001</u>		
* Testing Category: <u>ACCEPTANCE</u>	Field ID: <u>RA - 1A</u>		
Check Sample? <u>Y</u> <u>(N)</u> (circle One)	Proj/Po/Wo#: <u>34444.3.1</u>		
† Related Sample ID: _____	Line Item #: _____		
† Corr. Sample ID: _____	RE: <u>I.M. RESIDENT</u>		
# of Pieces: <u>2 - BAGS</u>	* Rep. Qty: <u>5000 TONS</u>		
* To Be Used In: <u>BASE</u>			
Comment:			
* Sampled Date: <u>2-9-09</u>		* Sampled By: <u>I.M. TECH</u>	
* Sample From: <u>ROADWAY</u>		Truck/Container #: _____	
Structure Number: _____	Route Desc: <u>OUTER LOOP</u>		
Route Type: <u>(1)</u> US NC SR (circle one)	Alignment: <u>- L -</u>		
Route Number: <u>540</u>	* Location: <u>NBL 10+15</u>	Offset Dist.: <u>15'</u>	
Map Number: _____	* Sta. From: <u>0+00</u>	Sta. To: <u>15+00</u>	
County: <u>WAKE</u>	Coastal Plain: <u>Y</u> <u>N</u> (circle one)		
† Producer/Supplier: _____	† Plant ID#: _____		<input type="checkbox"/> Approved
† Brand Name: _____	Shelf Life Date: _____		<input type="checkbox"/> Other
† Date Produced: _____	† Asphalt Mix/JMF ID: _____		
† Concrete Mix: _____			
† Alternate IDs Type:	Prefix	Range:	Description of Items:
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Please use reverse side for test data, comments, and additional information. Check here if more on reverse <input type="checkbox"/>			

Figure 1 - Information Required on Sample I.D. Card

## SECTION 6 – FAILURE OF RA SAMPLES

### Type A ABC and Type B ABC

Appendix C is a reproduction of Table 1010-1 from the NCDOT Specifications. Consider a 5,000-ton lot of ABC. When the average gradation test result (i.e., average of the “A” and “B” sample pair) falls within the limits of Column C of Table 1010-1, the lot will be accepted. When the average gradation test result falls outside the limits of Column C of Table 1010-1, the Contractor may request a check sample. If a check sample is requested, the Resident Engineer must notify the Soils Engineer of the Materials and Test Unit. Once the Soils Engineer is notified, the following steps will be taken (refer to Appendix D for flowchart summary):

1. Check samples from the 5,000-ton lot shall be obtained in order to isolate the unacceptable material. The procedure for this additional sampling shall consist of dividing the 5,000-ton lot of material into two 2,500-ton sub-lots and then obtaining a pair of check samples at random locations from each of these two sub-lots. The gradation results of each check sample pair shall be averaged and this average shall be used to determine the acceptance of each of the sub-lots.

When the average gradation test results for a sub-lot is within the limits shown in Table 1010-1, Column C, the sub-lot will be considered acceptable.

When the average gradation test results for a sub-lot exceed any of the limits shown in Table 1010-1, Column C, and the test results indicate the material can be corrected, the Engineer may allow the material to be corrected provided there is no additional cost to the Department for furnishing, adding, remixing, reshaping, and recompacting of the added material. The method of correcting the sub-lot shall be approved both by the Area Roadway Engineer and the Soils Engineer. When the average gradation test results of the corrected sub-lot are within the limits shown in Table 1010-1, Column B, the sub-lot will be considered acceptable.

When the average gradation test results for a sub-lot exceed any of the limits shown in Table 1010-1, Column C, and the sub-lot cannot be corrected or when the average gradation of a corrected sub-lot exceeds any of the limits of Table 1010-1, Column B, the sub-lot will be rejected and shall be removed and replaced at no additional cost to the Department unless otherwise approved by the Engineer. The replacement material shall meet the specification requirements for Type A ABC.

2. A new lot, comprising 5,000 tons of ABC or a fraction thereof placed after the 2,500 tons addressed above, shall be designated and the Roadway Assurance Sampling procedure described in Section 4 (A) shall be repeated for the new lot.

In the event of the failures of two consecutive lots, the Department may withdraw its approval of the Producer's Quality Control Program and the material will then be sampled, tested, and accepted by the Department in accordance with the provisions of Subarticle 520-6 (B) Type A ABC.

## **SECTION 7 – CHECK SAMPLES**

The Contractor may request that check samples be taken when a test sample(s) fails to meet specifications. The check samples may be taken before and/or after correction. The check samples are labeled as follows: RA-1C, RA-1D, RA-1E, RA-1F, etc. The same guidelines for obtaining and submitting samples are to be followed.



## APPENDIX A

### ABC Sampling Using Steel Sampling Ring

#### Equipment

Steel sampling ring (12-inch outside diameter, 9-inch deep)

Scoop/Large spoon

Small pick

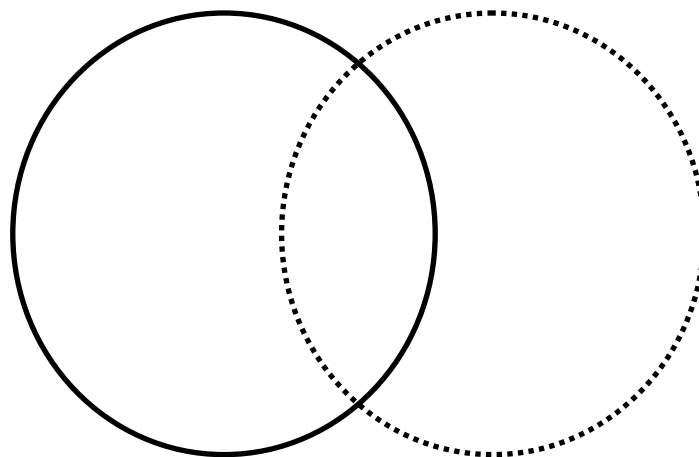
Sample bags in good condition

Wooden mallet

#### Procedure

NOTE: The following procedure is for taking one-half (either “A” or “B”) of the sample pair. Note that 70 pounds of material will require a minimum of 2 full bags of the M&T sampling bag. Therefore, an “A” sample should consist of more than one bag (for that matter, so should a “B” sample). The test is to be performed on loose lift and should not be within 2 feet of the edge of a spread.

1. Place sample ring on flat surface of material to be tested.
2. Use the pick to carefully loosen material and remove with scoop or spoon and place in sample bag.
3. Lower the ring as the material is removed. This can be accomplished by lightly tapping the top of the ring with a wooden mallet. Remove all material down to the full depth of the layer.
4. If two full bags have been obtained after the ring reaches the bottom of the layer, go to step 6. If not, move the ring over such that the new position of the ring overlaps with the previous position (see Figure A.1). The technician will exercise judgment on whether there is sufficient material within the ring’s new position so that the two-bag minimum will be attained.
5. Repeat steps 2 to 4.
6. Fill out a sample card accordingly. Again, this is either an “A” or “B” sample, but not both. A sample card must be placed in each bag of material.



This is a top view of the ring. The solid circle shows the location of the sampling ring. The dashed circle is an example of an acceptable new location for obtaining additional material. Note that the two locations must overlap.

**Figure A.1 - Moving the Sampling Ring**

## APPENDIX B

### Sampling Using Random Numbers

The purpose of using random numbers in taking samples is to ensure that sampling is unbiased. It prevents the preferential selection of a sample location based on some form of bias, such as sample appearance, etc.

Calculators with random-number generation features may be used. If this feature is not available, random numbers may be obtained from one of the twenty-six (26) random number tables available from the department (see example in Chapter 7 of manual). To ensure that the numbers obtained from these tables are truly random, a consistent pattern must be used in extracting numbers from the tables. Once a pattern is established, it shall be used for the duration of the project.

In ABC sampling, the random numbers are typically used to obtain the tonnage at which a sample is to be obtained.

Example 1: Type A ABC - roadway (assume a 12' lay-down width).

a) Random numbers are as follows:

1234   ← column numbers  
7316  
3204  
2976  
8303  
5556

b) Lot size = 5,000 tons

c) Take the "A" sample from the first 2,500 tons and the "B" sample from the second 2,500 tons

d) "A" sample to be taken at

$$2,500 \text{ tons} \times 0.73 = 1,825 \text{ tons}$$

$$12' \times 0.16 = 2' \text{ from either edge}$$

e) "B" sample to be taken at

$$2,500 \text{ tons} \times 0.32 = 800 \text{ tons} + 2,500 \text{ tons} = 3,300 \text{ tons}$$

$$12' \times 0.04 = .48' < 2' \Rightarrow \text{use } 2' \text{ from either edge}$$

f) Locate "A" and "B" sampling sites based on tonnage

Example 2: Type B ABC - spreader box or conveyor belt.

a) Random numbers are as follows:

1234   ← column numbers  
9264  
5858  
2889  
5131  
9055

b) Lot size = 5,000 tons

c) Take the “A” sample from the first 2,500 tons and the “B” sample from the second 2,500 tons

d) “A” sample to be taken at  
 $2,500 \times 0.92 = 2,300$  tons

e) “B” sample to be taken at  
 $2,500 \times 0.64 = 1,600$  tons + 2,500 tons = 4,100 tons

f) Locate “A” and “B” sampling sites based on tonnage

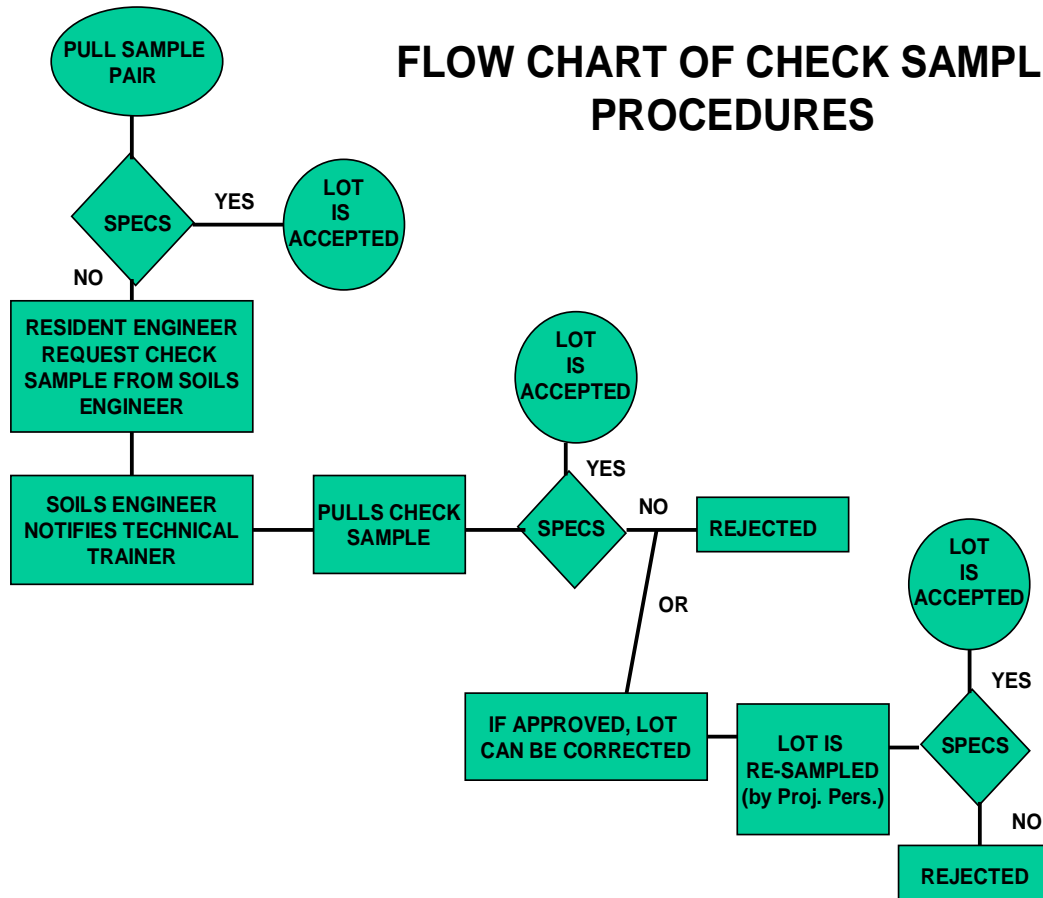
## **APPENDIX C**

**Table 1010-1  
Aggregate Base Course  
Gradation Acceptance Ranges**

<b>Column A</b> (Sieve Size)	<b>Column B</b> % Passing	<b>Column C</b> % Passing	<b>Column D</b> Range (between "A" and "B")	<b>Column E</b> (penalty points)
1-1/2"	100	98-100	3	1
1"	75-97	72-100	15	1
1/2"	55-80	51-83	20	1
#4	35-55	35-60	18	3
#10	25-45	20-50	18	2
#40	14-30	10-34	14	3
#200	4-12	3-13	7	5

## APPENDIX D

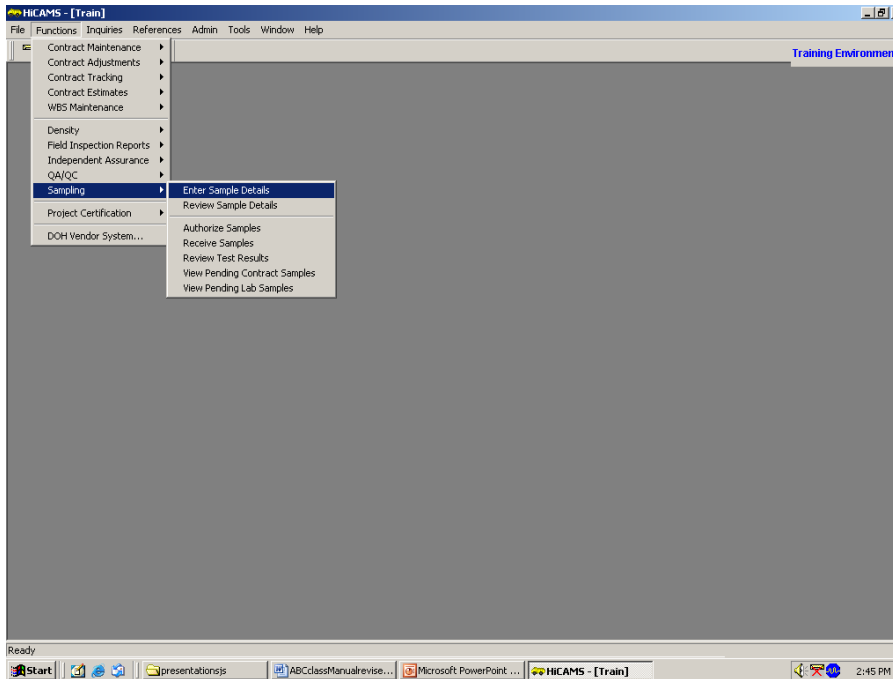
### FLOW CHART OF CHECK SAMPLE PROCEDURES



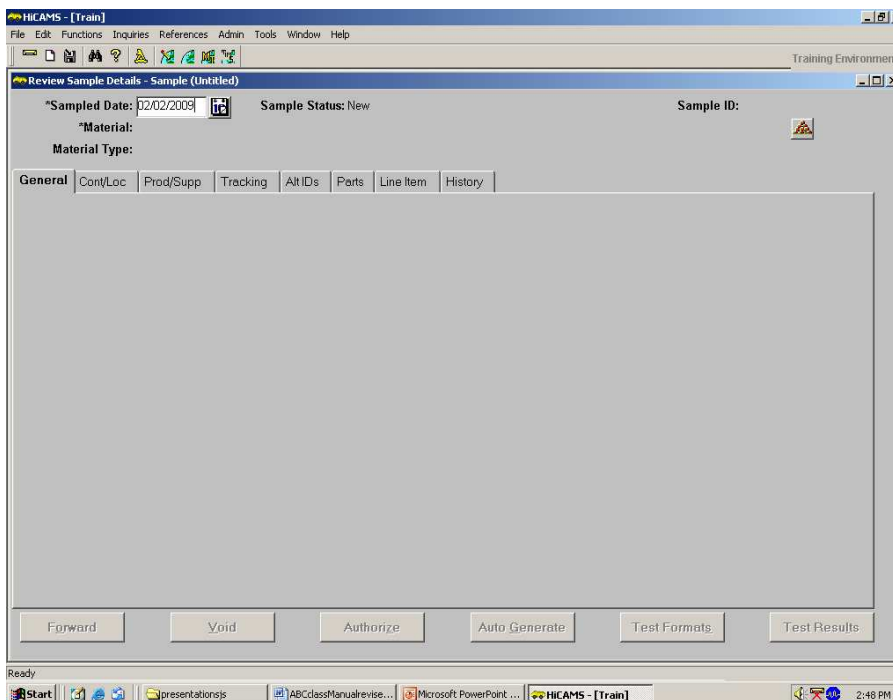
## APPENDIX E

### Procedures for entering samples into HiCAMs

Select “Functions”; then “Sampling”; then “Enter Sample Details”



Enter the “Sampled Date”



Enter “Contract” and select “Material Type” = “Aggregate Base Course”. Highlight appropriate item the aggregate material is being used in.

HiCAMS - [Train]

File Edit Functions Inquiries References Admin Tools Window Help

Material Selection

Filter: ☐ Material Type ☒ Contract

Material Type Group: (All) Contract: C201715

Material Type: Aggregate Base Course Line Item: (All)

Material: Unit of Measure: (All)

Metric/English: (All) From Date: 02/02/2009 To: 02/02/2009

Material	UOM	Line Item	Contract Mod	Work Item	Material Type	CBOM MSG From Date	CBOM MSG To Date	Grou
Aggregate Base Course, Type A	Metric Ton	491			Aggregate Base Course	04/17/2007	12/31/2075	Aggreg
Aggregate for Soil Cement Base	Metric Ton	91			Aggregate Base Course	04/17/2007	12/31/2075	Aggreg
Stabilizer Aggregate	Metric Ton	88			Aggregate Base Course	04/17/2007	12/31/2075	Aggreg

OK Cancel

Ready

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Enter required fields under the “General” tab. Only one sample needs to be created in HiCAMS for the “A” and “B” sample pair. Note the “Field ID” has “RA-4A,4B”

HiCAMS - [Train]

File Edit Functions Inquiries References Admin Tools Window Help

Training Environment

Review Sample Details - Sample (Untitled)

\*Sample Date: 02/02/2009 Sample Status: New Sample ID:

\*Material: Aggregate Base Course, Type A

Material Type: Aggregate Base Course (v3.01)

General Cont/Loc Prod/Supp Tracking Alt IDs Parts Line Item History

\*Sample Owner: Project \*Contract: C201715 Field ID: RA-4A,4B

\*Testing Category: Acceptance WBS: 34345.3.15

☐ Check Sample PO / Other ID:

+Related Sample ID: Auth Lab: Soils Lab

+IA Correlat. Field ID: Sample Freq: 5,000.000 UOM: Metric Ton

# of Pieces: 4 \*Represented Qty: 3,225.000 Avail Qty: 3,225.000

QC Sample ID:

To be used in: Roadway base

Comment:

Sample Frequency Comments: Please see the latest version of Aggregate QC/QA program.; See appropriate QC/QA manual for sample frequency. DENSITY: 9 meters in width or less>one per 300 meters.

Disposition

Accepted Qty: .000 Pay Adjusted Qty: .000

Removed Qty: .000 Checked by:

Forward Void Authorize Auto Generate Test Formats Test Results

Ready

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Enter required fields under the “Cont/Loc” tab

The screenshot shows the 'Review Sample Details - Sample (Untitled)' window in the HICAMS - [Train] application. The 'Cont/Loc' tab is selected, displaying various fields for sample location and identification. The 'Sampled Date' is 02/02/2009, and the 'Sample Status' is 'New'. The 'Material' is 'Aggregate Base Course, Type A' and the 'Material Type' is 'Aggregate Base Course (v3.01)'. The 'RE' is 'Smith, Brian' and the 'Office Phone' is '(336) 375-1774'. The 'Sample From' is 'Roadway'. The 'Structure Number' is '00000'. The 'Route Type' is 'US', 'Route Number' is '311', and 'Map Number' is empty. The 'Location' is '25+50 / 95+67', 'Offset Distance' is '3 / 6', '\*Station From' is '10 + 20', and '\*Station To' is '120 + 25'. The 'County' is 'Randolph' and the 'Coastal Plain' checkbox is unchecked. At the bottom, there are buttons for 'Forward', 'Void', 'Authorize', 'Auto Generate', 'Test Formats', and 'Test Results'.

Enter required fields under the “Tracking” tab.

The screenshot shows the 'Review Sample Details - Sample (Untitled)' window in the HICAMS - [Train] application, with the 'Tracking' tab selected. The 'Sampled Date' is 02/02/2009, and the 'Sample Status' is 'In Transit'. The 'Material' is 'Aggregate Base Course, Type A' and the 'Material Type' is 'Aggregate Base Course (v3.01)'. The 'Current Facility' section shows '\*Sampled By' as 'Gilliam, Christopher' and '\*Submitted To' as 'Soils Lab'. The '\*Submitted Date' is 02/02/2009. There is a 'Certification Override Comment' field. Below this is a table with columns 'Part ID', 'Sent', 'To', 'Received', and 'At'. At the bottom, there are buttons for 'Forward', 'Void', 'Authorize', 'Auto Generate', 'Test Formats', and 'Test Results'.

Part ID	Sent	To	Received	At

Enter “Approved Producer/Supplier” of the product under the “Prod/Supp” tab.

HiCAMS - [Train]

File Edit Functions Inquiries References Admin Tools Window Help

Training Environment

Review Sample Details - Sample (Untitled)

\*Sampled Date: 02/02/2009 Sample Status: In Transit Sample ID:

\*Material: Aggregate Base Course, Type A

Material Type: Aggregate Base Course (v3.01)

General Cont/Loc **Prod/Supp** Tracking Alt IDs Parts Line Item History

Search By Plant ID:

+Approved Producer/Supplier: Martin Marietta, East Alamosa Quarry - Haw River - CA201

+Other Producer/Supplier:

+Brand Name:

+Date Produced: 00/00/0000

Shelf Life Date: 00/00/0000

+Concrete Mix:

+Asphalt Mix/ JMF ID:

Forward Void Authorize Auto Generate Test Formats Test Results

Current status of sample.

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If all required information has been entered, pick the “Save” function. The system will prompt you if any required field(s) has not been entered. A “Sample ID:” will be displayed if all information is entered and the sample was successively saved into HiCAMS (record Sample ID # on sample card).

HiCAMS - [Train]

File Edit Functions Inquiries References Admin Tools Window Help

Training Environment

Review Sample Details - Sample 477490

\*Sampled Date: 02/02/2009 Sample Status: In Transit Sample ID: 477490

\*Material: Aggregate Base Course, Type A

Material Type: Aggregate Base Course (v3.01)

General Cont/Loc **Prod/Supp** Tracking Alt IDs Parts Line Item History

\*Sample Owner: Project +Contract: C201715 Field ID: RA-4A,4B

\*Testing Category: Acceptance WBS: 34345.3.15

☐ Check Sample PO / Other ID:

+Related Sample ID: Auth Lab: Soils Lab

+IA Correlat. Field ID: > ABC Test: Sample Freq: 5,000.000 UOM: Metric Ton

# of Pieces: 4 \*Represented Qty: 3,225.000 Avail Qty: 3,225.000

QC Sample ID:

To be used in: Roadway base

Comment:

Sample Frequency Comments: Please see the latest version of Aggregate QC/QA program.; See appropriate QC/QA manual for sample frequency. DENSITY: 9 meters in width or less>one per 300 meters.

Disposition

Accepted Qty: .000 Pay Adjusted Qty: .000

Removed Qty: .000 Checked by Sample:

Forward Void Authorize Auto Generate Test Formats Test Results

Ready

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Since the HiCAMS database is changed periodically, personnel responsible for entering data into the system should monitor the Construction Unit's website for updates. The information can be found under the "Resources & Forms" Section.

NCDOT: DOH: Construction Unit - Microsoft Internet Explorer provided by NCDOT v.05.1b

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites Media Print Mail Print Mail Print Mail

Address http://www.ncdot.org/doh/operations/dp\_chief\_eng/constructionunit/ Go Links

North Carolina Department of Transportation  
**Construction Unit**

HOME CONTACT SEARCH

NC DOT  
NC DOH  
NC GOV

**ONLINE SERVICES**

- + Committees & Conferences
- + Engineering & Inspection
- + Contractor Services
  - Pavement Construction
- + Public Information
  - Map of Roadway
  - Construction Engineer Work Areas
  - Map of Bridge
  - Construction Engineer Work Areas
- + Resources & Forms
  - Forms & Manuals
  - Memorandums & Bulletins
  - Transportation Standards
  - HiCAMS FAQs
  - HiCAMS User Guides
  - HiCAMS Release Notes
- Transportation Links

**HOME**

**Welcome to the Construction Unit**

The Construction Unit provides statewide support to the Division staff in the administration of construction contracts as well as other various responsibilities. Specific duties include providing consistent applications of the specifications on a statewide basis for roadway, bridge and pavement construction, processing of pay estimates and claims, tracking project progress and administration of DBE Program, facilitating the selection and administration of Private Engineering Firm contracts for Construction Engineering and Inspection, providing technical support for the HiCAMS computer system, developing and distributing information for project related impacts, developing and distributing materials to inform and educate the public about Work Zone Safety, and developing training materials for the Technician Skill Based Pay Program.

**Project Spotlight:**

**U.S. 17 Washington Bypass**  
[Project Website](#)

The U.S. 17 Washington Bypass will be constructed to relieve traffic congestion on existing U.S. 17 once it is open to traffic. The project will include additions that will improve access to areas in eastern North Carolina.

http://www.ncdot.org/doh/operations/dp\_chief\_eng/constructionunit/formsmanuals/UserGuide/Index\_User\_Guide.html

Start NCDOT: DOH: Construc... Internet 7:23 AM

The Materials and Tests website can also provide information relating to HiCAMS.

NCDOT Materials & Tests Unit: Home - Microsoft Internet Explorer provided by NCDOT v.05.1b

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites Media Print Mail Print Mail Print Mail

Address http://www.ncdot.org/doh/operations/materials/ Go Links

North Carolina Department of Transportation  
**Materials and Tests Unit**

HOME CONTACT SEARCH

NC DOT  
NC DOH  
NC GOV

**ONLINE NAVIGATION**

- M&T Work Groups
  - Administration
  - Asphalt Laboratory
  - Chemical Laboratory
  - Compliance & Assurance
  - Material Operations
  - Physical Testing Laboratory
  - Quality Assurance
  - Soils Laboratory
  - Structural Members
- M&T Training Schedule 2009
- Meeting Minutes
  - NCDOT/PCI Minutes
  - NCDOT/PCI JT Minutes
- Approved Lists
- Electronic Forms and User Manuals
- Minimum Sampling Guide
- Approved Procedures
- Online Standards
- HiCAMS M&T FAQs
- Links
  - AASHTO-SOM
  - ASTM
  - ACI
  - SSPC
  - AWS
  - TCCC

**HOME CONTACTS**

**Welcome to The Materials and Tests Unit**

The Materials and Tests Unit has the responsibility of establishing acceptance criteria for materials and manufactured products to be incorporated into the North Carolina highway system and insuring that these materials and manufactured products meet these criteria and will function as intended.

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The North Carolina  
Department of Transportation

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